

OMNEO network



en Configuration guide

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1 Introduction

This application note covers the configuration of a specific Cisco switch for the use with an OMNEO network. The interface that is shown in the application note is specific to the Cisco SG-300 switch. Other switches will have different management interfaces.

The parameters that are shown in the examples reflect common configurations for OMNEO hardware and can be implemented on any managed switches that support them.

All settings are shown with an example that is found in equipment used for training. This is for illustration purposes and the same steps and configuration can be applied to any kind of system with proper modifications.

The example covers the use of VLANs and RSTP in the network configuration. These details are provided for completeness but the use of VLANs and/or RSTP are not required to use OMNEO hardware.

2 Basics

This section describes an example setup.

For IRIS-Net Training small racks are used which look like this:



Cisco SG300-10: 10 port GBit Ethernet switch Electro-Voice N8000: Digital audio matrix equipped with DM-1 Dante module Electro-Voice TG-5: Amplifier equipped with RCM-28 remote control module with OMNEO interface

The Cisco SG300-10 switches in the racks should be configured as follows:

IP address

- Generally individual IP addresses are mandatory for all networks with multiple devices.
- Switches are allowed to have identical IP addresses in case no access to the web interface is needed.

Firmware

- Same switch firmware and boot loader is mandatory for all networks with multiple switches.
- See SG300 manual for details about firmware and boot loader updating.



Notice!

When updating from firmware lower than 1.3.7.18 you need to update to 1.3.7.18 first and after that to the latest firmware (07-Jul-2015: firmware 1.4.1.03)

Quality of Service (QoS)

- Settings can be optimized for use with Dante/OMNEO
- Mandatory for all networks with a lot of audio data traffic

Virtual LANs (VLAN)

- For Dante, IRIS-Net and OMNEO
- VLAN 1: Dante Primary, IRIS-Net control data, OMNEO Primary, switch management
- VLAN 2: Dante Secondary, OMNEO Secondary
- Mandatory for most networks where Glitch Free Redundancy is used



Trunk Ports

- For easy connection of multiple training racks with VLANs
- Trunk ports must carry both VLAN 1 and 2
- Mandatory for all networks where multiple switches and VLANs are used



Figure 2.1: Trunk ports

Rapid Spanning Tree Protocol (RSTP)

- For redundant connection (ring, mesh) of multiple training racks.
- Mandatory for all networks where ring or mesh connections are used



Figure 2.2: RSTP

Green Mode / Green Ethernet

- Feature for saving energy in Ethernet switches during periods with low network activity.
- Very likely to cause synchronization issues on a Dante network with device clocks drifting away from the system-wide clock.



Notice!

The Green Mode needs to be completely deactivated!



Notice!

Save configuration

Always after making changes to the switch configuration don't forget to permanently save the configuration – otherwise it will be lost after a reboot.

3 Configuration

3.1 General configuration

3.1.1 Connect and log in

1. Connect to the switch's default IP address 192.168.1.254 via web browser.



2. Enter user name "cisco" and password "cisco" and click on the Log In button.

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🗲 🕲 192.168.1.254/csd59e7132/config/log_off_page.htm	☆ マ C 🗧 - Google 👂 🐥	俞	•	•
uluita Switch	Username: cisco Password: ••••• Language: English • Log In Secure Browsing (HTTPS)			
© 2010-2013 Cisco Systems, Inc. All Rights Rese Cisco, Cisco Systems, and the Cisco Systems Io United States and certain other countries.	rved. go are registered trademarks or trademarks of Cisco Systems, Inc. and/or its affiliates in the			

3.1.2 Change IP address

1. On the Getting Started page go to Change Device IP Address.



2. Change the *IP Address* and subnet *Mask*, and then click on the *Apply* button.

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Small Business CISCO SG300-10 10-Port Gigabit Managed Switch Getting Started	cisco Language: English	•	Logout About Help
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3. Reconnect to the new IP address and log in again.

3.1.3 Edit location and name

1. On the Getting Started page go to System Summary.



2. Under System Summary enter a System Location and a Host Name.

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Getting Started Status and Statistics System Summary	System Summary System Information			Software Information		Î
Interface Etherlike	System Operational Mode:	L2 Mode		Firmware Version (Active	e Image):	1.3.0.62
GVRP	System Description:	10-Port Gigabit Managed Switch		Firmware MD5 Checksu	um (Active Image): 22347bc1ad
802.1x EAP	System Location:	IRIS-Net Training Rack 1	Edit	Firmware Version (Non-	active):	1.3.0.62
 RMON 	System Contact:		Edit	Firmware MD5 Checksu	um (Non-active):	22347bc1ad
View Log	Host Name:	Cisco-SG300-Rack1	Edit	Boot Version:		1.1.0.6 ⊑
Administration	System Object ID:	1.3.6.1.4.1.9.6.1.83.10.1		Boot MD5 Checksum:		8c6b1f42c07
Port Management	System Uptime:	0 dav(s), 1 hr(s), 9 min(s) and 24 sec(5)	Locale:		en-US
 Smartport 	Current Time:	16:04:25:2013-May-02		Language Version:		1.3.0.62
VLAN Management	Base MAC Address:	acce1::0:::::::::::::::::::::::::::::::::		Language MD5 Checks	um:	N/A
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IP Configuration Security	TCP/UDP Services Status	Edit				
 Access Control 	HTTP Service:	Enabled				
Quality of Service	HTTPS Service:	Enabled				
▶ SNMP	SNMP Service:	Disabled				
	Telnet Service	Disabled				
	SSH Service:	Disabled				
	•					
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3. Check the *Firmware Version* and if necessary make an update (see manual).

3.1.4 Change password

1. On the Getting Started page go to Change Device Password.



2. Under User Acounts edit the password (and user name) for the default user.

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Discovery - Bonjour Discovery - LLDP Discovery - CDP Ping Traceroute				
MAC Address Tables Multicast IP Configuration Security				
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3.1.5 Save running configuration on the switch

- 1. Go to Administration > File Management > Copy/Save Configuration.
- 2. Under *Copy/Save Configuration* select source *Running configuration* and destination *Startup configuration* and click on the *Apply* button.



3.1.6 Save running configuration as a file on a PC

- 1. Go to Administration > File Management > Download/Backup Configuration.
- 2. Under Download/Backup Configuration select Transfer Method: via HTTP, Save Action: Download, SourceFile Type: Running configuration and Sensitive Data: Encrypted and click on the Apply button.



3. Under Open running-config.txt select *Save File*. A file running-config.txt is saved under Downloads (green arrow symbol in Firefox web browser, see screenshot).

Öffnen von running-co	nfig.txt							
Sie möchten folgend	le Datei öffnen:							
running-config.txt								
Vom Typ: Text Document								
Von: http://192.168.1.10								
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Öffnen mit	Notepad (Standard)							
Datei speichern								
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Getting Started Status and Statistics Administration Bytes Transferred: 14176	9	
System Settings Status: Copy finished Console Settings Error Message: • Management Interface User Accounts Idle Session Timeout		

3.2 QoS configuration

- 1. Go to Quality of Service > General > QoS Properties.
- 2. Under QoS Properties select QoS Mode Advanced and click on the Apply button.

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		2	GE2	0								
▼ General		3	GE3	0								
QoS Properties		4	GE4	0								
CoS/802.1p to Queue		5	GE5	0								
DSCP to Queue		6	GE6	0								
Bandwidth		7	GE7	0								
VI AN Ingress Rate Limit		8	GE8	0								
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QoS Basic Mode		10	GE10	0				2				
 QoS Advanced Mode QoS Statistics 		Copy Set	lings	Edit		Restore Defa	aults					
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3. Under Queue select *Strict Priority* for 1-4 and click on the *Apply* button.

## SG300-10 10-Port Gigabit Managed Switch + Image: Small Business Small Business Image: SG300-10 10-Port Gigabit Managed Switch Cueue Status and Statistics Administration > Status and Statistics Cueue > Administration Cueue > Port Management Strict Priority > VLAN Management 1 > Spanning Tree 3 > Multicast IP Configuration > Becurity Cancel	C C Google P cisco Language English	↓ ↑ ↓ Logou	K - 🏤
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Queue 1 has the lowest priority, queue 4 has the highest priority.			
 General Gos Properties Oueue Cos/802.1p to Queue DSCP to Queue Bandwidth Egress Shaping Per Que VLAN Ingress Rate Limit TCP Congestion Avoidar Cos Basic Mode Gos Advanced Mode Global Settings Out of Profile DSCP Mapl ↓ 			

4.	Under DSCP to	Queue make th	he following	settings and	l click on	the Apply button.
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Security	1	1	1/	2	33	3 .	49	4
Access Control	2	1.	18 (AF21)	2 •	34 (AF41)	3	50	4 -
Quality of Service	3	1 -	19	2 •	35	3 -	51	4 -
r General	4	1 -	20 (AF22)	2 -	36 (AF42)	3 💌	52	4 💌
QoS Properties	5	1 -	21	2 💌	37	3 💌	53	4 💌
Queue CoS/802 1n to Queue	6	1 -	22 (AF23)	2 💌	38 (AF43)	3 💌	54	4 -
DSCP to Queue	7	1 -	23	2 -	39	3 💌	55	4 -
Bandwidth	8 (CS1)	1 -	24 (CS3)	2 💌	40 (CS5)	3 💌	56 (CS7)	4 💌
Egress Shaping Per Que	9	1 💌	25	2 💌	41	3 💌	57	4 💌
VLAN Ingress Rate Limit	10 (AF11)	1 💌	26 (AF31)	2 💌	42	3 💌	58	4 💌
TCP Congestion Avoidar	11	1 -	27	2 💌	43	3 👻	59	4 💌
 QoS Advanced Mode 	12 (AF12)	1 -	28 (AF32)	2 💌	44	3 💌	60	4 💌
Global Settings	13	1 💌	29	2 💌	45	3 💌	61	4 💌
Out of Profile DSCP Map	14 (AF13)	1 -	30 (AF33)	2 💌	46 (EF)	3 💌	62	4 💌
Class Mapping	15	1 -	31	2 💌	47	3 👻	63	4 💌
Aggregate Policer	Apply	Cancel	Restore De	faults				
Policy Table Policy Class Mans								
Policy Binding	Queue 1 has the	owest priority, qu	ieue 4 has the hig	hest priority.				

5. Go to Quality of Service > QoS Advanced Mode > Global Settings.

6. Under *Global Settings* make the following settings and click on the *Apply* button.

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QoS Statistics SNMP				
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Notice!

Don't forget to save the changes you made!

3.3 VLAN configuration

1. Go to VLAN Management > Create VLAN and click on the Add... button.

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Getting Started		
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✓ VLAN Management		
Default VLAN Settings Create VLAN Interface Settings Port to VLAN Port VLAN Membership GVRP Settings • VLAN Korups • VLAN Korups • Voice VLAN • Access Port Multicast TV VLAN • Customer Port Multicast TV VLAN • Customer Port Multicast TV VLAN • Spanning Tree • MAC Address Tables • Multicast • IP Configuration • Security	Add Delete	
Security		
Access Control		
Quality of Service		
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2. Under Add VLAN enter *VLAN ID: 2* and *VLAN Name: Secondary* and click on the *Apply* button.

VLAN		
VLAN ID: 2	(Range: 2 - 4094)	
VLAN Name: Secondary	(9/32 Characters Used)	
Range		
& VLAN Range:	-	(Range: 2 - 409
Apply		
Apply Close		

3. Under *Create VLAN* check if the VLAN Secondary with ID 2 has been created.

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4. Under Port to VLAN make the following settings and click on the Apply button.

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Administration Port Management	Filter: VLAN ID	equals	to 1	▼ AN	ID Inte	rface T	vpe eq	uals to	Port	•	Go						
Smartport VLAN Management Default VLAN Settings Create VLAN Interface Settings Port VLAN Membership GVRP Settings VLAN Groups Voter VLAN Access Port Multicast TV VLAN Customer Port Multicast TV VLAN	Interface Access Trunk General Customer Forbidden Excluded Tagged Untagged Multicast TV VLAN PVID	GE1 © C C C C C C C C C C C C C	GE2	GE3 0 0 0 0 0 0 0 0 0 0 0 0 0	GE4	GE5 (a) (b) (c) (c) (c) (c) (c) (c) (c) (c	GE6 © 0 0 0 0 0 0 0 0	GE7 0 0 0 0 0 0 0 0	GE8 (a) (c) (c) (c) (c) (c) (c) (c) (c	GE9 () () () () () () () () () ()	GE10 © © © © © © © © ©						
Spanning Tree MAC Address Tables Multicast IP Configuration Security Access Control Quality of Service SNMP VIII - VIII - VIIII - VIIII - VIIII Quality of Service SNMP VIII - VIIII - VIIII - VIIII - VIIII Quality of Service SNMP	Apply (Cancel) P	ort VLAN	N Memi	bership	Table)									

5. Under Port to VLAN select VLAN ID equals to 2, click on the Go button.

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192.106.1.10/CS059E/152/NON	sentri						_	14	C	0 10	sooyie	~	m		2
Small Business									cisco	Lang	uage: English				
SG300-10 10	0-Port Gigat	oit M	ana	aed	Swit	ch									
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VI AN Management	Interface	GE1	GE2	GE3	GE4	GE5	GE6	GE7	GE8	GE9	GE10				
Default VI AN Settings	Access	0	۲	0	0	۲	۲	۲	0						
Create VI AN	Trunk									۲	۲				
Interface Settings	General														
Port to VLAN	Customer														
Port VLAN Membership	Forbidden	۲	۲	۲	۲	۲	0	\bigcirc	\bigcirc	0	0				
GVRP Settings	Excluded	\bigcirc	0	0	0	0	0	0	0	0	0				
VLAN Groups	Tagged									۲	۲				
 Voice VLAN Access Port Multicast TV VI AN 	Untagged	0	0	0	0	0	۲	۲	۲	0	0				
 Customer Port Multicast TV VLA 	Multicast TV VLAN	0	0	0	0	0	0	0	0						
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IP Configuration															
Security															
Access Control															
Quality of Service															
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6. Under Port to VLAN make the following settings and click on the Apply button.

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Getting Started Status and Statistics	Port to VLAN														
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Smartport	Interface	GE1	GE2	GE3	GE4	GE5	GE6	GE7	GE8	GE9	GE10				
VLAN Management	Access	۲	۲	(0)	0	(0)	0	(<u>©</u>)	(0)		0				
Default VLAN Settings	Trunk	õ	0	0	0			õ	õ	0	0				
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Interface Settings	Customer														
Port VI AN Membershin	Forbidden	0			0		0	6	0	0	0				
GVRP Settings	Excluded	õ	ě	0	ő	ě	ĕ	Ø	Ä	õ	ő				
VLAN Groups	Tagged	0	0	0	0	0	0	0	0	0					
Voice VLAN	Lintaged	0	6	8	8					0					
Access Port Multicast TV VLAI	Multicact TV/VLAN		6	0		6		0	0	-	0				
Customer Port Multicast TV VI			0	9	0	2	0	0			2				
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Security															
Access Control															
Quality of Service															
SNMP															



Notice!

Don't forget to save the changes you made!

3.4 RSTP configuration

- 1. Go to Spanning Tree > STP Status & Global Settings.
- 2. Under STP Status & Global Settings make the following settings...

 3 192.168.1.10/csd59e7132/home.htm 			🏠 ⊽ C 🛛 🔀 → Google	₽ ♣	俞	- 13	
Small Business CISCO SG300-10 10-Port	Gigabit Man	aged Switch	cisco Language: English		Logo	ut Abou	ut He
Getting Started STP Status and Statistics	tatus & Global S	Settings					
Administration Globa	al Settings						
Smartport Span	ning Tree State:	Enable					
VLAN Management STP 0 Spanning Tree	Operation Mode:	 Classic STP Rapid STP Multiple STP 					
STP Interface Settings BPDU RSTP Interface Settings	J Handling:	 Filtering Flooding 					
MSTP Properties Path VLAN to MSTP Instance MSTP Instance Settings	Cost Default Values:	 Short Long 					
MSTP Interface Settings	e Settings		7				
MAC Address Tables			-				
IP Configuration	ty:	32768	(Range: 0 - 61440, Default: 32768)				
Security d Hello	Time:	9	sec (Range: 1 - 10, Default: 2)				
Access Control C Max A	lge:	22	sec (Range: 6 - 40, Default: 20)				
Quality of Service Forward Forward	ard Time:	30	sec (Range: 4 - 30, Default: 15)				
Desig	nated Root						
Bridg	e ID:	32768-ec:e1:a9:c4:83:	86				
Poot	Pridae ID:	22769.00:01:00:04:92	96				

... and click on the Apply button.

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Spanning Tree B	ridge Settings					
STP Status & Global Settings						
STP Interface Settings	riority:	32768	(Range: 0 - 61440, Default: 32768)			
MSTP Properties	ello Time:	9	sec (Range: 1 - 10, Default: 2)			
VLAN to MSTP Instance or M	ax Aqe:	22	sec (Range: 6 - 40. Default: 20)			
MSTP Instance Settings	-	1				
MSTP Interface Settings	orward time:	30	sec (Range: 4 - 30, Default: 15)			
Multicast						
IP Configuration	esignated Root					
Security B	ridge ID:	32768-ec:e1:a9:c4:83:86	5			
Access Control R	oot Bridge ID:	32768-ec:e1:a9:c4:83:86	3			
Quality of Service R	oot Port:	0				
SNMP R	oot Path Cost:	0				
т	pology Changes Counts:	0				
L	ast Topology Change:	0D/3H/27M/44S				

i |

Notice!

Don't forget to save the changes you made!

3.5

Green Mode configuration

- 1. Go to Port Management -> Green Ethernet.
- 2. Under Properties make the following settings and click on the Apply button:



3. Under Port Settings select Entry No. 1 and click on the Edit... button:

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4. In the Edit Port Settings dialog which opens make the following settings and click on the Apply button:

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l	Short Reach Mode and 802.3 Energy Efficien	nt Ethernet (EE	EE) cannot be activated on a port at	the same time.
l	Interface:	GE1 💌		
l	Energy Detect:	🔲 Enable		
l	Short Reach:	📄 Enable		
l	802.3 Energy Efficient Ethernet (EEE):	📄 Enable		
l	802.3 Energy Efficient Ethernet (EEE) LLDP:	: 📄 Enable		
	Apply Close			

5. Close the dialog by clicking on the Close button

Edit Port Setting - Mozilla Firefox		- • ×
192.168.1.10/cs2c1d3f38/GW/PopUp.htm?E	idit	
Short Reach Mode and 802.3 Energy Efficie	nt Ethernet (EEE) cannot be activated on a port a	t the same time.
Interface:	GE1 💌	
Energy Detect:	Enable	
Short Reach:	Enable	
802.3 Energy Efficient Ethernet (EEE):	Enable	
802.3 Energy Efficient Ethernet (EEE) LLDP	Enable	
Apply Close		

6. Under Port Settings select Entry No. 1 and click on the Copy Settings... button:

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7. In the Copy Settings dialog which opens enter 2-10 in the field labeled with to: and click on the Apply button:

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192.168.1.10/cs2c1d3f38/config/copyDialogGen.htm	
Copy configuration from entry 1 (GE1)	
to: [2-10] (Example: 1,3,5-10 or: GE1,GE3-GE5)	l
Close	

8. Close the dialog by clicking on the Close button



9. After the switch reports back Success, check again the settings:

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Getting Started F Status and Statistics	Por	t Setting	s									
 Administration Port Management 	Success. To permanently save the configuration, go to the Copy/Save Configuration page or click the Save icon.											
Port Settings For the functions and/or parameters configured on this page to become effective, you may have to configure the corresponding global parameters configured on this page to become effective, you may have to configure the corresponding global parameters become effective. Lonpback Detection Settings Global Parameter Status Link Aggregation Energy Detect Mode: Disabled Short Reach Mode: Disabled 802.3 Energy Efficient Ethernet (EEE) Mode: Disabled												
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 Security 	0	5	GE5	Disabled	Disabled		Disabled	Disabled			Disabled	
 Access Control 	0	6	GE6	Disabled	Disabled		Disabled	Disabled			Disabled	
 Quality of Service 	0	7	GE7	Disabled	Disabled		Disabled	Disabled			Disabled	
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Please also scroll right:

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 Spanning Tree 		Disabled	Disabled			Disabled	Disabled	Disabled	Disabled	Yes	
MAC Address Tables		Disabled	Disabled			Disabled	Disabled	Disabled	Disabled	No	
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Notice!

Don't forget to save the changes you made!

4 Default settings

Cisco SG300 Series factory default settings:

Default IP address: 192.168.1.254 Default subnet mask: 255.255.255.0 Default user name: cisco

Default password: cisco

PC's network settings:

For configuration of a new, unconfigured Cisco SG300 switch assign an IP address from the 192.168.1.1 to 192.168.1.253 range and subnet mask 255.255.255.0 to your PC's network interface.

Internet Protocol Version 4 (TCP/IPv4) Properties									
General									
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.									
Obtain an IP address automatically									
Use the following IP address:									
IP address:	192.168.1.19								
Subnet mask:	255 . 255 . 255 . 0								
Default gateway:	192.168.1.1								
Obtain DNS server address automatically									
O Use the following DNS server add	resses:								
Preferred DNS server:									
Alternate DNS server:	· · ·								
Validate settings upon exit	Ad <u>v</u> anced								
	OK Cancel								

Bosch Security Systems B.V.

Torenallee 49 5617 BA Eindhoven The Netherlands www.boschsecurity.com © Bosch Security Systems B.V., 2015